

CLAIMS

What is claimed is:

1. A two-shaft vacuum pump comprising two shafts (12,14), wherein one of the shafts (14) is driven by an electric drive motor (20) and comprises a motor rotor (26), the drive motor (20) being a synchronous motor, wherein

the motor rotor (26) is permanently excited, and

a synchronous motor power-limiting device (58) is provided which limits the motor power (P_M) to a fixed maximum motor power (P_{Mmax}) in a limiting range above a fixed rated motor speed (n_N).
2. The two-shaft vacuum pump according to claim 1, wherein the power-limiting means (58) adjusts, in the limiting range, the phase angle between the magnetic field of the rotor and the electrical stator field to an angle other than 90° .
3. The two-shaft vacuum pump according to claim 1, wherein the power-limiting means (58) reduces the stator current in the limiting range.
4. The two-shaft vacuum pump according to claim 1, wherein the power-limiting device (58) adjusts, in the limiting range, the phase angle between the magnetic field of the rotor and the electrical stator field and/or the stator current as a function of the speed.
5. The two-shaft vacuum pump according to claim 1, wherein the driven rotor shaft (14) is of overhung configuration and supported without a supporting bearing at the motor-side end.

6. The two-shaft vacuum pump according to claim 1, wherein the motor rotor (26) comprises a plurality of permanent magnets (38) arranged on the outside of the motor rotor body (34).
7. The two-shaft vacuum pump according to claim 6, wherein the motor rotor (26) comprises a rotor enclosure (40) of a nonmagnetic material which externally encloses the motor rotor body (34) and the permanent magnets (38).
8. The two-shaft vacuum pump according to claim 1, wherein on the stator side a can (42) of a nonmagnetic material is provided which gas-tightly seals the motor rotor (26) towards the motor stator (28).
9. The two-shaft vacuum pump according to claim 8, wherein a pump cover (48) holding the can (42) and a stator casing (50) surrounding the motor stator (28) are integrally formed.
10. The two-shaft vacuum pump according to claim 7, wherein the permanent magnets (38) of the rotor are made of rare earths.